

## REMARKS

The Office Action dated August 9, 2005 has been received and carefully considered. In this response, claims 1, 2, 4, 5, 7, 8, 10-12, 16, 17, 20, 21, and 51-78 have been amended to correct various informalities, improve consistency between claims, and to remove reference to unnecessary “step of” phrasing. The amendments to the claims do not narrow the scope of the claims. The specification and figures also have been amended to correct various informalities. Support for the amendments to the specification, figures and claims may be found in the specification and drawings as originally filed. Reconsideration of the outstanding objections and rejections in the present application is respectfully requested based on the following remarks.

### **Allowability of Claims 12-14**

The Applicants note with appreciation the indication at section 16 of the Office Action that claims 12-14 would be allowable if rewritten in independent form including all of the features of the base claim and any intervening claims. The Applicants have opted to forgo rewriting claims 12-14 as independent claims in view of the remarks provided herein.

### **Objection to the Specification and Drawings**

At sections 2-5 of the Office Action, the specification and figures are objected to for having various formalities. The specification and figures have been amended consistent with the Examiner’s remarks. Amended FIGs. 2 and 3 are submitted herewith as Replacement FIGs. 2 and 3 attached as Appendix A. Withdrawal of these objections therefore is respectfully requested.

### **Enablement Rejection of Claims 11, 17-21, 61, and 67-70**

At section 7 of the Office Action, claims 11, 17-21, 61, and 67-70 are rejected under 35 U.S.C. Section 112, first paragraph, as failing to comply with the enablement requirement. This rejection is respectfully traversed.

With respect to claims 11 and 61, written description enabling the recited features can be found in the specification at, *inter alia*, page 11, line 12 to page 12, line 4.

With respect to claims 17 and 67, written description enabling the recited features can be found, *inter alia*, at sub-steps 530, 535, 540, 545, 550 and 555 of FIG. 5 and in the corresponding passage at page 13, line 1 to page 14, line 16.

With respect to claims 18 and 68, written description enabling the recited features can be found, *inter alia*, at the passages at page 9, lines 1-4 and 18-21 and page 13, lines 19-22.

With respect to claims 19 and 69, written description enabling the recited features can be found, *inter alia*, at the passage at page 13, lines 25-26.

With respect to claims 20 and 70, written description enabling the recited features can be found, *inter alia*, at the passage at page 14, lines 1-16.

With respect to claim 21, written description enabling the recited features can be found, *inter alia*, at sub-steps 530, 535, 540, 545, 550 and 555 of FIG. 5 and in the corresponding passage at page 13, line 1 to page 14, line 16.

In view of the foregoing, it is respectfully submitted that claims 11, 17-21, 61 and 67-70 are enabled by the specification and figures as originally filed. Reconsideration and withdrawal of the enablement rejection therefore is respectfully requested.

#### **Indefinite Rejection of Claims 4-9, 16-20, 54-59, and 66-70**

At section 8 of the Office Action, claims 4-9, 16-20, 54-59, and 66-70 are rejected under 35 U.S.C. Section 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. The claims have been amended consistent with the Examiner's suggestions. Reconsideration and withdrawal of the indefinite rejection therefore is respectfully requested.

#### **Non-Statutory Subject Matter Rejection of Claims 51-70**

At section 10 of the Office Action, claims 51-70 are rejected under 35 U.S.C. Section 101 as being directed to non-statutory subject matter. Although it is believed that the claimed subject matter of claims 51-70 as originally presented is directed to statutory subject matter, in an effort to advance the present application, the preambles of claims 51-70 have been amended consistent

with the Examiner's suggestion. Withdrawal of the non-statutory subject matter rejection therefore is respectfully requested.

### **Anticipation Rejection of Claims 1-8, 51-57, and 59**

At page 8 of the Office Action, claims 1-8, 51-57, and 59 were rejected under 35 U.S.C. Section 102(e) as being anticipated by Furukawa (U.S. Patent No. 6,834,080). This rejection is hereby respectfully traversed because Furukawa fails to disclose the particular combinations of features recited by claims 1-8, 51-57, and 59.

#### ***Furukawa fails to disclose determining a second quantization value based on an expected amount of video data in a video buffer as recited by claims 1 and 51***

Claim 1, from which claims 2-8 depend, and claim 51, from which claims 52-57 and 59 depend, recite the features of determining a second quantization value for a first macroblock based on a first quantization value and an expected amount of video data in a video buffer. The Office Action asserts that the passages of Furukawa at col. 7, lines 4-10 and col. 11, line 65 to col. 12, line 21 disclose these features. *Office Action*, p. 8. Specifically, the Office Action asserts that these features are disclosed because "the number of generated bits 133 of Figure 1 output from buffer 21 represents the first expected amount of video data, which is used as a basis for calculating the second quantization value." *Id.* The Applicants respectfully disagree.

Furukawa fails to disclose that the quantization width QP' (which the Office Action considers equivalent to the second quantization value feature of claims 1 and 51) is based on an expected amount of video data in a video buffer. Rather, Furukawa teaches that variable length encoding of quantized DCT coefficient data 104 is performed to generate variable length code (also referred to as encoded bit stream 111), which is temporarily stored in the buffer 21. *See, e.g., Furukawa*, col. 5, lines 3-9 and col. 5, line 65 to col. 6, line 2. The number of generated bits 133 for the encoded bit stream 111 is determined and compared with a target number of bits 134, and if the difference between the number of generated bits 133 and the target number of bits 134 exceeds a threshold, the encoded parameters 131 (which include the quantization width QP) are adjusted and the quantized DCT coefficient data 104 is re-encoded using the adjusted quantized DCT coefficient data. *See, e.g., Id.*, col. 4, lines 43-47, col. 6, lines 3-23, col. 6, line 66 to col. 7, line 10. Thus, Furukawa discloses that the quantization width QP is adjusted to

generate quantization width QP' based on a difference between the actual number of bits in the encoded data and a target number of bits.

One of ordinary skill in the art will appreciate that determining a modified quantization width QP' based on the difference between the number of bits generated for a variable length code and a target number of bits as disclosed by Furukawa is not equivalent to determining a second quantization value based on an expected amount of video data in a video buffer for at least the reason that the number of generated bits 133 is not representative of an expected amount of video data in a video buffer. To illustrate, the buffer 21 could store other variable length codes that were previously encoded and not yet accessed for transmission as part of encoded output 200 that "is fed to a transmission line or stored in a storage medium." *Furukawa*, col. 6, lines 21-22. Further, Furukawa fails to disclose monitoring the buffer 21 to determine the expected amount of video data in it at any given time. Thus, because the number of generated bits 133 represents only the data size of a particular variable length code that is provided to the buffer 21 and does not provide any indication of the expected amount of data already stored in the buffer 21 at the time that the variable length code is provided for storage, the number of generated bits 133 is utterly unsuitable as an indicator or representation of the expected amount of video data stored in the buffer 21. Thus, because the number of generated bits 133 represents only the amount of data provided to be stored in the buffer 21 at a given point in time and therefore is not representative of the expected amount of video data stored in the buffer 21 and because Furukawa discloses that it is the difference between the number of generated bits 133 and the target number of bits 134 that triggers modification of the quantization with QP, Furukawa fails to disclose, or even suggest, the features of determining a second quantization value based on a first quantization value and an expected amount of video data in a video buffer as recited by claims 1 and 51.

***Furukawa fails to disclose that an address location of the video buffer represents the expected amount of data in the video buffer as recited by claims 4 and 54***

Claims 4 and 54, which depend from claims 1 and 51, respectively, recite the additional features of wherein an address location of the video buffer represents the expected amount of video data in the video buffer. The Office Action asserts that the buffer 21 of Figure 1 of Furukawa discloses these features. *Office Action*, p. 9. However, it is respectfully submitted that

neither element 21 of Figure 1 nor any passage of Furukawa discloses an address location of the buffer 21 in any manner, much less that an address location of the buffer 21 represents an expected amount of video data in the buffer 21 as recited by claims 4 and 54. Furukawa therefore fails to disclose, or even suggest, the features of wherein an address location of the video buffer represents the expected amount of video data in the video buffer as recited by claims 4 and 54.

***Furukawa fails to disclose that a buffer delay value indicating when a frame is to be processed represents the expected amount of video data in the video buffer as recited by claims 5 and 55***

Claims 5 and 55, which depend from claims 1 and 51, respectively, recite the additional features of wherein a buffer delay value indicating when a frame is to be processed represents the expected amount of video data in the video buffer. The Office Action asserts that “the number of bits 133 of Figure 1 represents the buffer delay value, which is based on a number of frames stored in video buffer 21 and is determined on a modeling of the video buffer 21” and cites the passages of Furukawa at col. 5, lines 51-60, col. 6, lines 3-8 in support of this assertion. *Office Action*, p. 9. However, Furukawa does not disclose that the frame rate FR determines when a frame is to be processed, nor does Furukawa disclose that the frame rate FR represents the expected amount of video data stored in the buffer 21. Further, as discussed below with respect to claims 7-9 and 57-59, Furukawa does not disclose the modeling of the buffer 21 in any manner. Thus, contrary to the assertions of the Office Action, Furukawa fails to disclose, or even suggest, the features of wherein a buffer delay value indicating when a frame is to be processed represents the expected amount of video data in the video buffer as recited by claims 5 and 55.

***Furukawa fails to disclose that the buffer delay value is based on a number of frames stored in a buffer location of the video buffer as recited by claims 6 and 56***

Claims 6 and 56, which depend from claims 5 and 55, respectively, recite the additional features of wherein the buffer delay value is based on a number of frames stored in a buffer location of the video buffer. Contrary to the assertions of the Office Action, Furukawa does not disclose that the number of frames stored in a buffer location of the buffer 21 are determined in any manner, so Furukawa necessarily fails to disclose, or even suggest, that the buffer delay

value is based on a number of frames stored in a buffer location of the video buffer as recited by claims 6 and 56.

***Furukawa fails to disclose that the expected amount of video data is determined based on a modeling of the video buffer as recited by claims 7 and 57***

Claims 7 and 57, which depend from claims 1 and 51, respectively, recite the additional features of wherein the expected amount of video data is determined based on a modeling of the video buffer. The Office Action asserts that these features are “provided by [buffer] 21 of Figure 1.” *Office Action*, p. 9. Further, in discussing the rejection of claims 8 and 58 (which depend from claims 7 and 57), the Office Action asserts that “number of encoded bit determination section 33 determines the fullness of video buffer 21 based on a difference between [an] input rate (target number of bits 134) and [an] output rate (number of generated [bits] 133), thereby providing a modeling of the video buffer [21]” and cites the passage of Furukawa at col. 6, lines 3-22 in support of this assertion. As noted above, neither the number of generated bits 133 nor the difference between the number of generated bits 133 and the target number of bits 134 is representative of the expected amount of video data in the buffer 21, nor does Furukawa disclose that these values are used to model the buffer 21 in any manner. Instead, Furukawa discloses that when the difference between the number of generated bits 133 and the target number of bits 134 exceeds a threshold, the quantization width QP used to encode the quantized DCT coefficient data 104 and vector information 110 is modified to generate quantization width QP’, which is then used to re-encode the same quantized DCT coefficient data 104 and vector information 110 for a second time. See e.g., *Furukawa*, col. 5, line 9 to col. 6, line 30. Further, as also discussed above, Furukawa fails to disclose a mechanism for monitoring or estimating the amount of data output from the buffer 21. Thus, because the number of generated bits 133 and the target number of bits 134 (and the difference between the two) has no direct correlation with the expected amount of data provided for storage in the buffer 21 and because Furukawa fails to disclose a mechanism for determining or estimating the amount of data output from the buffer 21, Furukawa fails to disclose that the buffer 21 is modeled in any way. Furukawa therefore fails to disclose, or even suggest, the features of wherein the expected amount of video data is determined based on a modeling of the video buffer as recited by claims 7 and 57.

***Furukawa fails to disclose that the modeling of the video buffer includes determining a fullness of the video buffer based on a difference between an input rate and an output rate as recited by claims 8 and 59***

Claims 8 and 59, which depend from claims 7 and 57, respectively, recite the additional features of wherein the modeling of the video buffer includes determining a fullness of the video buffer based on a difference between an input rate and an output rate. As discussed above, Furukawa fails to disclose a mechanism for determining the rate at which data is output by the buffer 21. Further, as also discussed above, Furukawa fails to disclose a mechanism for determining the rate at which data is input to the buffer 21. Furukawa therefore necessarily fails to disclose, or even suggest, that the modeling of the video buffer includes determining a fullness of the buffer based on a difference between an input rate and an output rate as recited by claims 8 and 59.

***Furukawa fails to disclose each and every feature recited by claims 1-8, 51-57 and 59***

As discussed above, Furukawa fails to disclose each and every feature recited by independent claims 1 and 51, as well as the additional features recited by claims 2-8, 52-57 and 59 at least by virtue of their dependency from one of claims 1 or 51. Moreover, these dependent claims recite additional non-obvious subject matter, as also discussed above. Accordingly, reconsideration and withdrawal of the anticipation rejection of claims 1-8, 52-57 and 59 therefore is respectfully requested.

**Obviousness Rejection of Claims 9 and 58**

At page 10 of the Office Action, claims 9 and 58 are rejected under 35 U.S.C. Section 103(a) as being unpatentable over Furukawa and further in view of Legall (5,929,916). This rejection is respectfully traversed.

As discussed above, Furukawa fails to disclose each and every feature recited by claims 1 and 51. The Office Action does not assert that Legall discloses or suggests the features of claims 1 and 51 absent from the teachings of Furukawa, nor does Legall in fact disclose or suggest these features. Accordingly, the proposed combination of Furukawa and Legall fails to disclose or suggest the additional features of claims 9 and 58 at least by virtue of their dependency from claims 1 and 51, respectively.

Moreover, there is no motivation to combine the teachings of Furukawa and Legall as proposed by the Office Action. Claims 9 and 58 recite the additional features of wherein modeling of the video buffer includes a VBV buffer model. The Office Action asserts that Legall teaches at cols. 4 and 5 that VBV model features are old and well recognized in the art. However, Legall teaches that a video buffer verifier (VBV) buffer is maintained by the encoder to model a decoder buffer so as to prevent a decoder buffer exception, whereas the buffer 21 of Furukawa repeatedly referenced by the Office Action is an output buffer of an encoder. Moreover, Furukawa provides no suggestion that it seeks to prevent “underflows and overflows” of its buffer 21. Thus, as the teachings of Legall apply to modeling a decoder buffer, whereas the teachings of Furukawa are applicable to an encoder, one of ordinary skill in the art would find no motivation to combine the teachings of Furukawa and Legall absent a hind-sign reconstruction in view of the present application.

In view of the foregoing, it is respectfully submitted that there is no motivation to combine the teachings of Furukawa and Legall as proposed, and even if combined, the combination of Furukawa and Legall fails to disclose or suggest each and every feature of claims 9 and 58 at least by virtue of their dependency from claims 1 and 51, respectively. Reconsideration and withdrawal of the obviousness rejection of claims 9 and 58 therefore is respectfully requested.

#### **Obviousness Rejection of Claims 10, 15, 16, 60, 65, and 66**

At page 10 of the Office Action, claims 10, 15, 16, 60, 65, and 66 are rejected under 35 U.S.C. Section 103(a) as being unpatentable over Furukawa in view of Kan (Low-Complexity and Low-Delay Video Transcoding for Compressed MPEG-2 Bitstream). This rejection is respectfully traversed.

As discussed above, Furukawa fails to disclose each and every feature recited by claims 1 and 51. The Office Action does not assert that Kan discloses or suggests the features of claims 1 and 51 absent from the teachings of Furukawa, nor does Kan in fact disclose or suggest these features. Accordingly, the proposed combination of Furukawa and Kan fails to disclose or suggest the additional features of claims 10, 15, 16, 60, 65 and 66 at least by virtue of their dependency from claims 1 and 51, respectively. Moreover, these dependent claims recite subject

matter that is non-obvious in view of the cited references. Reconsideration and withdrawal of this rejection therefore is respectfully requested.

**Conclusion**

The Applicants respectfully submit that the present application is in condition for allowance, and an early indication of the same is courteously solicited. The Examiner is respectfully requested to contact the undersigned by telephone at the below listed telephone number in order to expedite resolution of any issues and to expedite passage of the present application to issue, if any comments, questions, or suggestions arise in connection with the present application.

The Commissioner is hereby authorized to charge any fees that may be required, or credit any overpayment, to Deposit Account Number 50-1835.

Respectfully submitted,

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Date



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**APPENDIX A**

**DRAWING AMENDMENTS**

Please replace FIGs. 2 and 3 with the amended FIGs. 2 and 3 attached as Appendix A.